

PATENT ABSTRACTS OF JAPAN

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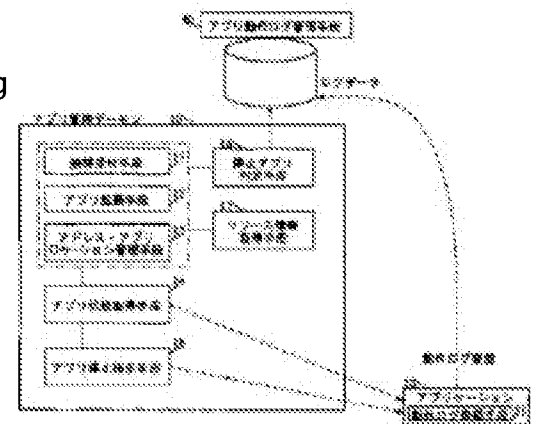
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(54) DEVICE AND SYSTEM FOR MANAGING APPLICATION

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a device for performing application management in which resource consumption of equipment and increase of overhead are suppressed.

SOLUTION: In this application managing device for managing startup or installation of the application, a connection accepting means 11 to accept a connection request to the application the address of which is specified, an address/application location managing means 13 to manage correspondence between the address of the application and a place of entity of a program, an application state acquiring means 14 to acquire the current state of the application the connection of which is requested, a resource information acquiring means 17 to acquire the quantity of currently usable resources and a stopped/deleted application judging means 16 to judge the application to be stopped or deleted to secure the quantity of resource required for start up or installation of a new application are provided. A resident application is held in a startup state within a range to be allowed by the resources and when the resources run short when the application is newly started, the application to be stopped is decided based on judgment algorithm.



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CLAIMS

[Claim(s)]

[Claim 1]In application controlling equipment which manages starting of application or installation, A connection receiving means which receives a connection request to application which specified an address, an address and an application which manage correspondence with an address of application, and a place of substance of a program -- with a location management tool. An application state acquisition means which acquires the present state of application by which the connection request was carried out, In order to secure resource quantity required for a resource information acquisition means which acquires quantity of the present available resource, starting of new application, or installation, Stop / deletion application judging means which judges application which should be stopped or deleted, Application stop and a deletion instruction means to direct a stop or deletion to application which said stop / deletion application judging means determined, Application controlling equipment provided with an application starting means which starts application by which the connection request was carried out.

[Claim 2]Said application state acquisition means acquires information on being under starting, and application by which the connection request was carried out said stop / deletion application judging means, When it cannot perform by judging whether execution of said application is possible with quantity of a resource which said resource information acquisition means acquired while said application was not starting, The application controlling equipment according to claim 1, wherein it judges application under starting which should be suspended and said stop and deletion instruction means direct a stop of application which said stop / deletion application judging means judged.

[Claim 3]Said stop / deletion application judging means, The application controlling equipment according to claim 2 with which finish time of transaction processing performed these days is characterized by making the oldest application applicable to a stop in application which

analyzed log data of application under starting and has ended transaction processing.

[Claim 4]The application controlling equipment according to claim 2, wherein said stop / deletion application judging means makes applicable to a stop application with least number of times which analyzed log data of application under starting and from which processing was requested from a client.

[Claim 5]Said stop / deletion application judging means, The application controlling equipment according to claim 2 selecting combination of application made applicable to a stop so that quantity of a resource which should be secured in order to start said application by which the connection request was carried out may be filled and the number of applications may serve as the minimum.

[Claim 6]Said application state acquisition means acquires information on whether application by which the connection request was carried out is installed on a disk, Said stop / deletion application judging means, When it cannot be judged whether installation of said application is possible with quantity of a resource which said resource information acquisition means acquired when said application was not installed and cannot install, The application controlling equipment according to claim 1, wherein it judges application which should be deleted and said stop and deletion instruction means direct deletion of application which said stop / deletion application judging means judged.

[Claim 7]The application controlling equipment according to claim 6, wherein said stop / deletion application judging means analyzes log data of application installed and makes application with the longest stop period applicable to deletion.

[Claim 8]In an application controlling system provided with the application controlling equipment according to any one of claims 1 to 7 and an application controlling server which controls starting of application of said application controlling equipment, or installation through a network, An application situation remote providing means to which said application controlling equipment provides said application controlling server with an installation situation or a starting situation of application via a network, a remote which receives an installation demand or an activate request of application from said application controlling server -- an application -- it has a management demand receiving means and said application controlling server via a network, An application situation remote acquisition means which acquires an installation situation or a starting situation of application from said application controlling equipment, Have a remote application controlling request means which outputs an installation demand or an activate request of application to said application controlling equipment, and said application controlling equipment, said remote -- an application -- an application controlling system performing installation or starting of application according to said installation demand or an activate request received by a management demand receiving means.

[Claim 9]The application controlling system according to claim 8 which is provided with the

following and characterized by avoiding fee collection when re-downloading the same application to the same terminal unit.

Said application controlling equipment is provided with a terminal certifying means proving a possession person in charge of a terminal unit with which the application controlling equipment concerned belongs, and said application controlling server, A terminal authentication means which attests a download place terminal using said terminal certifying means when downloading application to said terminal unit.

A terminal and an application royalty management tool which manages correspondence with an attested terminal unit and downloaded application

[Claim 10]When application deleted with directions of said stop and deletion instruction means has an user datum, said application controlling equipment, Evacuation of said user datum is required of said application controlling server, When said application is re-installed, said application controlling server is equipped with an user-datum evacuation / restoration means to require restoration of said user datum, Said application controlling server accumulates said user datum by the server side in response to an evacuation demand of said user datum from said user-datum evacuation / restoration means, The application controlling system according to claim 8 or 9 provided with an user-datum management tool which manages and transmits said user datum to said user-datum evacuation / restoration means in response to a restoration demand of said user datum from said user-datum evacuation / restoration means.

[Claim 11]An application controlling server which controls starting of application of application controlling equipment, or installation through a network, comprising:

An application situation remote acquisition means which acquires an installation situation or a starting situation of application from said application controlling equipment via a network.

A remote application controlling request means which outputs an installation demand or an activate request of application to said application controlling equipment.

[Claim 12]The application controlling server according to claim 11 which is provided with the following and characterized by avoiding fee collection when re-downloading the same application to the same terminal unit.

A terminal authentication means which attests a download place terminal when downloading application to said terminal unit with which said application controlling equipment belongs.

A terminal and an application royalty management tool which manages correspondence with an attested terminal unit and downloaded application

[Claim 13]From said application controlling equipment, said user datum is accumulated by the server side in response to an evacuation demand of an user datum which application to delete

has, It manages, Said application. The application controlling server according to claim 11 or 12 provided with an user-datum management tool which transmits said user datum to said application controlling equipment in response to a restoration demand of said user datum from said re-installed application controlling equipment.

[Claim 14]STB which has the application controlling equipment according to any one of claims 1 to 7, a home gateway, a video telephone terminal, a game machine, or networked home equipment.

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PRIOR ART

[Description of the Prior Art]In recent years, white home appliances and AV equipment linked to a network, STB (set-top box), etc. are advanced at tempo with early development of the electrical household appliances and electrical equipment made intelligent. These apparatus called networked home, an information home appliance, etc. is deficient in a resource generally. Although this problem is solvable by extension of a memory, etc., since the cost of apparatus will be pushed up, it is hard to take the policy which reinforces a hardware side in practice. Therefore, raising the utilization efficiency of a resource and compensating resource shortage is called for.

[0003]Conventionally, the system which aims at reduction of the memory usage of a permanent residence daemon program group is known as a method of using the resource of a computer effectively. A daemon program resides in a system permanently, receives the demand from a user, and performs automatically system control which a user should be made to control directly and which does not come out. When a daemon program group resides in a system permanently, Since much memory usage is needed, only the demon called "Inetd" as a representative of a daemon program group is always started, and other demons consist of this system so that Inetd may start only at the time of execution.

[0004]Drawing 12 explains operation of Inetd. If the access request from waiting and ** client program to a specific port comes, Inetd the access request from a client program, It is received and the application of the specified port is searched from the configuration file as which the ** service name:port number / protocol kind was specified.

Next, a service name:program location : ** The place of the program of the searched application is acquired from the configuration file as which the starting option was specified, ** Start the program of an applicable place and connect a network socket connected to ** client to the standard input/output of a program. An application program is executed only when connected to the standard input/output.

** A program will be ended if the work requested from the client finishes.

[0005] Thus, when only the execution time starts demons other than Inetd, memory consumption can be saved rather than all the demons reside in a memory permanently in the state of accept.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention realizes application controlling which held down resource consumption especially about the application controlling equipment which manages starting of the application program of apparatus with scarce resources (memory storage, such as a memory and HDD, CPU power), such as networked home, and its system.

[0002]

[Description of the Prior Art]In recent years, white home appliances and AV equipment linked to a network, STB (set-top box), etc. are advanced at tempo with early development of the electrical household appliances and electrical equipment made intelligent. These apparatus called networked home, an information home appliance, etc. is deficient in a resource generally. Although this problem is solvable by extension of a memory, etc., since the cost of apparatus will be pushed up, it is hard to take the policy which reinforces a hardware side in practice. Therefore, raising the utilization efficiency of a resource and compensating resource shortage is called for.

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** A program will be ended if the work requested from the client finishes.

[0005]Thus, when only the execution time starts demons other than Inetd, memory consumption can be saved rather than all the demons reside in a memory permanently in the state of accept.

[0006]

[Problem to be solved by the invention]However, since the daemon program itself is terminated in this conventional system when work is completed in order to hold down memory consumption, Whenever there is a demand from a client, it is necessary to repeat processing of ** to **, and there is a problem which says that the overhead at the time of starting (time which is not directly used on work of the purpose) is large.

[0007]This invention solves such a conventional problem, and holds down the resource consumption of apparatus, and suppresses the increase in an overhead, and an object of this invention is to provide the application controlling equipment which can carry out starting management of application efficiently, and its system.

[0008]

[Means for solving problem]So, in this invention, the application controlling equipment which manages starting of application or installation is provided with the following.

The connection receiving means which receives the connection request to the application which specified the address.

the address and application which manage correspondence with the address of application, and the place of the substance of a program -- a location management tool.

The application state acquisition means which acquires the present state of the application by which the connection request was carried out.

In order to secure resource quantity required for the resource information acquisition means which acquires the quantity of the present available resource, starting of new application, or installation, Stop / deletion application judging means which judges the application which should be stopped or deleted, Application stop and a deletion instruction means to direct a stop or deletion to the application which said stop / deletion application judging means determined, and the application starting means which starts the application by which the connection request was carried out.

[0009]In an application controlling system provided with this application controlling equipment and an application controlling server which controls starting of application of said application controlling equipment, or installation through a network, An application situation remote providing means which provides said application controlling equipment with an installation situation or a starting situation of application via a network at said application controlling server, a remote which receives an installation demand or an activate request of application from said application controlling server -- an application -- a management demand receiving means being established and via a network to an application controlling server, An application situation remote acquisition means which acquires an installation situation or a starting situation of application from said application controlling equipment, Establish a remote application controlling request means which outputs an installation demand or an activate request of application to said application controlling equipment, and application controlling equipment, said remote -- an application -- it constitutes so that installation or starting of application may be performed according to an installation demand or an activate request received by a management demand receiving means.

[0010]This application controlling equipment has determined application which stops based on a judgment algorithm, only when maintaining permanent residence application to activation status in the range which a resource allows, newly starting application and resources run short. If installation of application installs all the applications which have the possibility of a connection request beforehand, there is, and it installs according to a demand. [no] Therefore, starting management of efficient application and installation management which held down resource consumption of a terminal equipment and suppressed an increase in an overhead can be performed.

[0011]

[Mode for carrying out the invention](A 1st embodiment) A 1st embodiment explains application controlling equipment which manages starting of a resided-permanently type application program.

[0012]If this application controlling equipment has a margin in a resource, it permits that each of resident type application holds activation status. Therefore, when application demanded from a client program is starting, the application is performed promptly. When application demanded from a client program is starting, and there is nothing and it is necessary to newly start, in order to secure quantity of a resource required for execution of the application, application under starting is stopped if needed.

[0013]This equipment is provided with the following.

The application controlling demon 10 who manages starting of the application 30 as shown in drawing 1.

An application operation log management means 40 to manage a change of state of the application 30.

The application 30 shows application under starting. The application 30 is provided with a log registration means 31 of operation to register one's change of state into the application operation log management means 40, and the application 30 under starting outputs log data showing its change of state to the log registration means 31 of operation.

[0014]The application controlling demon 10 has the following.

The connection receiving means 11 which receives a connection request to application demanded by specifying an address from a client program.

an address and an application which retrieve information for starting application from an address which managed correspondence with an address of application, and a place of substance of a program, and received a connection request -- the location management tool 13.

an address and an application -- the application starting means 12 which starts application based on location information of application obtained from the location management tool 13.

The application state acquisition means 14 which acquires the present state of the application 30 where a connection request was received, The resource information acquisition means 17 which acquires information on quantity of an available resource in the actual condition when application which received a connection request newly needs to be started, The stop application judging means 16 which judges application which judges whether execution of application which received a connection request from information which the resource information acquisition means 17 acquired is possible, and should stop when impossible, An application stop instruction means 15 to perform stop instruction to the application 30 for [which the stop application judging means 16 determined] a stop.

[0015]the connection receiving means 11, an address, and an application -- also in the equipment which carries out the conventional system (drawing 12), the location management tool 13 and the application starting means 12 are realized.

[0016]Drawing 2 shows the operation flow of this equipment.

** A client program specifies URL 1, perform the connection request to the application 1, and the application controlling demon's 10 connection receiving means 11 receives this connection request.

** Identify whether the application state acquisition means 14 has the application 1 in the application under starting. If the application 1 is starting, operation of the application controlling demon's 10 starting management will be ended. While the application 1 is not starting, ** resource information acquisition means 17 acquires the quantity of an available resource now. The stop application judging means 16 judges whether execution of the application 1 is

possible in the quantity of this resource. When not possible, ** stop application judging means 16 judges the application stopped based on the application log data managed by the application operation log management means 40.

[0017]As shown in drawing 3, log data, such as an application name, activity, and time, are managed by the application operation log management means 40, for example. The stop application judging means 16 judges application with the oldest end of transaction processing performed in application under starting these days as stop application as a judgment algorithm, for example. In this case, the application 2 turns into application for a stop.

[0018]** The application stop instruction means 15 directs a stop to the application 2 used as a candidate for a stop.

** an address and an application -- the location management tool 13, A table which described a correspondence relation of a place (location information) of an application name, an address, and program substance is managed, and location information corresponding to application 1 / URL1 which received a connection request is searched from this table.

** the application starting means 12 -- an address and an application -- start the application 1 of a location position which the location management tool 13 searched.

[0019]In **, only in the quantity of the resource which can be used now, when execution of the application 1 is possible, processing of ** and ** is performed after **.

[0020]Thus, in this application controlling equipment, only when starting new application and a required resource is not securable, the application under starting is stopped and it does not stop other than it. Therefore, the probability which the application demanded by the client program is starting can become high, it can see synthetically, and reduction of the overhead at the time of starting can be aimed at.

[0021]As for the stop application judging means 16, it is also possible for the number of times from which processing was requested to judge stop target application based on the judgment algorithm which makes the fewest application applicable to a stop from a client program. In this case, the application 3 is elected as a candidate for a stop from the application log data of drawing 3.

[0022]In the application log data which the application operation log management means 40 manages, as shown in drawing 4, The stop application judging means 16 as a judgment algorithm which judges stop target application, including resource information required for operation of each application, In order to secure resource quantity required for the application which newly starts, the number of the stopping applications is able to select stop target application based on the algorithm which chooses the combination of the application used as the minimum. In this case, if it is necessary to secure the opening of 100 KB of resource in order to perform application 1, the application 4 will be chosen from drawing 4 as a candidate for a stop.

[0023]The number of the stopping applications can be lessened by using such a judgment algorithm. If it puts in another way, the application under starting can be kept [many] and the probability which the application demanded by the client program is starting can be raised.

[0024]Specifically, operation of the application controlling equipment explained by this embodiment is performed, when STB provided with broadcast reception or the function of an Internet connectivity receives the distribution service of contents from the server on the Internet based on the demand from a client.

[0025]The following procedures are needed when receiving the distribution service of contents.

(1) application (2) reception of a contents distribution service -- the check of a soft existence and a version -- if suitable receiving software does not exist, download.

(3) If the check receiving software of the state of receiving software has not started, hang starting.

(4) Other software will be suspended or uninstalled if the check resource of the remaining resource is insufficient.

(5) When contents distribution start STB performs processing of (3) and (4), perform the application controlling equipment of STB efficiently by the procedure which shows starting of receiving software required in order to receive distribution of contents by this embodiment.

[0026](A 2nd embodiment) A 2nd embodiment explains application controlling equipment which performs download processing of application efficiently. This processing is equivalent to processing of the above in a case of receiving distribution service of contents (2).

[0027]This equipment is provided with the following.

The connection receiving means 11 which receives a connection request to application demanded by specifying an address from a client program as shown in drawing 5.

The application state acquisition means 14 which judges whether demanded application is installed on the local disk 46.

The application starting means 12 which starts demanded application.

an address and an application which search a download place of application from an address which managed correspondence with an address of application, and application location information, and received a connection request -- with the location management tool 13. a case where application by which the connection request was carried out is not installed on the local disk 46 -- an address and an application -- downloading agency information from the location management tool 13, [acquire and] Application download and an accumulation management means 45 to download application to need to a local disk, The resource information acquisition means 17 which judges whether disk space for application accumulation is insufficient when downloading application, Stop / deletion application judging means 161 which specifies application deleted from the local disk 46 (uninstallation) when it

runs short, and an application stop and a deleting means 45 which delete specified deletion target application from a local disk.

[0028]Drawing 6 shows the operation flow of this equipment.

** A client program specifies URL 1, perform the connection request to the application 1, and the application controlling demon's 10 connection receiving means 11 receives this connection request.

** the application in which the application state acquisition means 14 manages accumulation of the application to the local disk 46 -- acquire the information on whether the application 1 is installed on the local disk 46 from the download accumulation management means 45. the case where the application 1 is not installed -- ** resource information acquisition means 17 -- an application -- the empty disk storage capacity of the local disk 46 is acquired from the download accumulation management means 45. Stop / deletion application judging means 161 judges whether installation of the application 1 is possible with this empty disk storage capacity. When not possible, ** stop / deletion application judging means 161 judges the application deleted based on the application log data managed by the application operation log management means 40.

[0029]As shown in drawing 7, log data, such as an application name, activity, and time, are managed by the application operation log management means 40, for example. Stop / deletion application judging means 161 judges the longest application of stop time as deletion target application as a judgment algorithm, for example. In this case, the application 2 turns into application for deletion.

[0030]** An application stop and the deletion instruction means 151, an application -- pointing to deletion from the local disk 46 of the application 2 used as a candidate for deletion to the download accumulation management means 45 -- an application -- the download accumulation management means 45 deletes the application 2 from the local disk 46.

** an address and an application -- the location management tool 13 has managed a table which described a correspondence relation of a place (location information) of an application name, an address, and program substance, and location information of the application 1 serves as a server on a network in this stage. an application -- the download accumulation management means 45 -- an address and an application -- location information of the application 1 is acquired from the location management tool 13, and the application 1 is installed from an application download site which ** location information shows.

** an address and an application -- the location management tool 13 rewrites the location information of the program of the application 1 at the place of the installed local disk 46.

** After that, start the application 1 by the procedure of a 1st embodiment.

[0031]In **, when the application 1 is installed on the local disk 46, it shifts to **. In **, when the

empty disk storage capacity which can install the application 1 exists, it shifts to **.

[0032] Thus, the disk storage capacity for application accumulation can be saved by installing according to a demand, without installing all the applications that may receive a connection request beforehand.

[0033] (A 3rd embodiment) By a 3rd embodiment, an application controlling server explains the application controlling system which operates application controlling equipment by remote control.

[0034] This system comprises the network terminal 50 which has application controlling equipment, and the application controlling server 60 which controls installation and starting of application in the network terminal 50 through a network, as shown in drawing 8.

[0035] Application controlling equipment of the network terminal 50 is provided with the following.

The application situation remote providing means 18 which provides the application controlling server 60 with information about an installation situation, and starting and a stop state of application via a network besides composition (drawing 5) of a 2nd embodiment.

a remote which receives an installation demand and an activate request of application from the application controlling server 60, and performs download installation and starting of application according to a demand -- an application -- the management demand receiving means 19.

[0036] The application controlling server 60 is provided with the following.

The application situation remote acquisition means 61 which acquires a situation (an installation situation, a starting situation) of application from application controlling equipment of the network terminal 50 via a network.

The remote application controlling request means 62 which performs installation or an activate request via a network when application is not installed or it is not started.

[0037] The application controlling server 60 of this system is controlled to, install receiving software required in order to receive a contents distribution service in the network terminal 50 for example, before a client advances a demand, or controls that starting.

[0038] Drawing 9 shows the operation flow of this system.

** The application situation remote acquisition means 61 of the application controlling server 60 acquires the installation situation, and starting and a stop state of application from the application situation remote providing means 18 of application controlling equipment via a network.

** The remote application controlling request means 62 of the application controlling server 60 requires installation or starting of the application 1 via a network, when the application 1 is not installed or it is not started.

** application controlling equipment -- a remote -- an application -- the management demand receiving means 19 receives the installation demand or activate request from the application controlling server 60. When the application 1 is installed by the installation procedure explained by a 2nd embodiment when an installation demand was received and an activate request is received, the application 1 is started with the activation procedure explained by a 1st embodiment.

** a case where the new application 1 is installed -- an address and an application -- the location management tool 13 adds an entry of the application 1 to a management table.

** Since the application 1 is already installed or is started when there is a connection request from a client program to the application 1, a demand of a client can be accepted immediately. [0039] Thus, when a client carries out [this system] a connection request, even if application is not installed or started a priori by terminal, The server side can grasp a situation of a terminal, application can be set as a predetermined state, and connection from a client can be enabled. [0040] (A 4th embodiment) In an application controlling system of a 4th embodiment, when downloading application eliminated for resource reservation again, it has prevented that double accounting is carried out.

[0041] If in service charged at the time of download of application it deletes for resource reservation of purchased application as a 2nd embodiment explained, when downloading the application again, it will be charged again. This system has prevented such double accounting.

[0042] As shown in drawing 10, in this system the application controlling equipment of the network terminal 50, It has the terminal certifying means 20 for specifying and proving the possession person in charge of the network terminal 50, The terminal authentication means 63 with which the application controlling server 60 uses the terminal certifying means 20 at the time of application download, and attests a download place terminal, It has the terminal and the application royalty management tool 64 which manages correspondence with the network terminal 50 and application which were attested.

[0043] In this system, when the network terminal 50 downloads application from the application controlling server 60, the terminal authentication means 63 of the application controlling server 60 attests a download place terminal using the terminal certifying means 20. The terminal and the application royalty management tool 64 of the application controlling server 60 manage the correspondence relation of the network terminal and application which were attested.

[0044] the connection request with after that and a client for the second time which once deletes in the network terminal 50 for resource reservation of the purchased application 1 -- the application 1 -- re--- it may download and install. At this time, the terminal authentication means 63 of the application controlling server 60 attests the network terminal 50 by the terminal certifying means 20 of the network terminal 50. And a terminal and the application

royalty management tool 64 check that the attested network terminal 50 has purchased the application 1 in the past from management data, and omits the fee collection to this download.

[0045]thus -- this system -- a terminal -- application -- re--- even when downloading and installing, double accounting can be prevented to the application purchased once.

[0046](A 5th embodiment) In the application controlling system of a 5th embodiment, even when the application deleted for resource reservation has an user datum, the user datum can be saved by an application controlling server.

[0047]As shown in drawing 11, in this system the application controlling equipment of the network terminal 50, An user datum is evacuated to the application controlling server 60 at the time of deletion of application, It has an user-datum evacuation / restoration means 21 to restore an user datum at the time of re-installation, and has the user-datum management tool 65 in which the application controlling server 60 manages the evacuated user datum.

[0048]The application deleted for resource reservation in this system, When it has user data, such as operation logs, taste information, work data, user-datum evacuation / restoration means 21 of the network terminal 50 sends the evacuation demand of an user datum to the user-datum management tool 65 of the application controlling server 60, and transmits an user datum to it.

[0049]The user-datum management tool 65 accumulates and manages an user datum which received in response to an evacuation demand of an user datum. When user-datum evacuation / restoration means 21 of the network terminal 50 installs application again, it sends a restoration demand of said user datum to the user-datum management tool 65 of the application controlling server 60. The user-datum management tool 65 transmits an user datum which has won popularity and managed [accumulate and] a restoration demand of an user datum to user-datum evacuation / restoration means 21.

[0050]Thus, in this system, even when deleting application for resource reservation, an user datum which accompanies application can be saved, without consuming a resource of a terminal.

[0051]Networked home and a home gateway not only with STB but a scarce resource, a video telephone terminal, a game machine, etc. can be provided with application controlling equipment of this invention.

[0052]

[Effect of the Invention]In the application controlling equipment and the application controlling system of this invention, the starting management of efficient application and installation management which held down the resource consumption of apparatus and suppressed the increase in an overhead can be performed so that clearly from the above explanation.

[0053]In this equipment, since permanent residence application is started in the range which a resource allows, the demand of a client can be satisfied promptly.

[0054] Since installation of application is performed according to the demand, the disk storage capacity which application accumulation takes can be saved.

[0055] In the system which enabled it to control operation of application controlling equipment from a server, the situation of application can be prepared beforehand [of a demand of a client] and the demand of a client can be satisfied promptly.

[0056] The double accounting which may be generated when deleting application and utilizing a resource, and disappearance of an user datum can be prevented.

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MEANS

[Means for solving problem]So, in this invention, the application controlling equipment which manages starting of application or installation is provided with the following.

The connection receiving means which receives the connection request to the application which specified the address.

the address and application which manage correspondence with the address of application, and the place of the substance of a program -- a location management tool.

The application state acquisition means which acquires the present state of the application by which the connection request was carried out.

In order to secure resource quantity required for the resource information acquisition means which acquires the quantity of the present available resource, starting of new application, or installation, Stop / deletion application judging means which judges the application which should be stopped or deleted, Application stop and a deletion instruction means to direct a stop or deletion to the application which said stop / deletion application judging means determined, and the application starting means which starts the application by which the connection request was carried out.

[0009]In an application controlling system provided with this application controlling equipment and the application controlling server which controls starting of the application of said application controlling equipment, or installation through a network, The application situation remote providing means which provides said application controlling equipment with the installation situation or starting situation of application via a network at said application controlling server, the remote which receives an installation demand or activate request of application from said application controlling server -- an application -- a management demand receiving means being established and via a network to an application controlling server, The application situation remote acquisition means which acquires the installation situation or

starting situation of application from said application controlling equipment, Establish the remote application controlling request means which outputs an installation demand or activate request of application to said application controlling equipment, and application controlling equipment, said remote -- an application -- it constitutes so that installation or starting of application may be performed according to the installation demand or activate request received by the management demand receiving means.

[0010]This application controlling equipment has determined the application which stops based on a judgment algorithm, only when maintaining permanent residence application to activation status in the range which a resource allows, newly starting application and resources run short. If installation of application installs all the applications which have the possibility of a connection request beforehand, there is, and it installs according to a demand. [no]

Therefore, the starting management of efficient application and installation management which held down the resource consumption of the terminal equipment and suppressed the increase in an overhead can be performed.

[0011]

[Mode for carrying out the invention](A 1st embodiment) A 1st embodiment explains the application controlling equipment which manages starting of a resided-permanently type application program.

[0012]If this application controlling equipment has a margin in a resource, it permits that each of resident type application holds activation status. Therefore, when the application demanded from the client program is starting, the application is performed promptly. When the application demanded from the client program is starting, and there is nothing and it is necessary to newly start, in order to secure the quantity of a resource required for execution of the application, the application under starting is stopped if needed.

[0013]This equipment is provided with the following.

The application controlling demon 10 who manages starting of the application 30 as shown in drawing 1.

An application operation log management means 40 to manage the change of state of the application 30.

The application 30 shows the application under starting. The application 30 is provided with a log registration means 31 of operation to register one's change of state into the application operation log management means 40, and the application 30 under starting outputs the log data showing its change of state to the log registration means 31 of operation.

[0014]The application controlling demon 10 has the following.

The connection receiving means 11 which receives the connection request to the application demanded by specifying an address from the client program.

the address and application which retrieve the information for starting application from the

address which managed correspondence with the address of application, and the place of the substance of a program, and received the connection request -- the location management tool 13.

an address and an application -- the application starting means 12 which starts application based on the location information of the application obtained from the location management tool 13.

The application state acquisition means 14 which acquires the present state of the application 30 where the connection request was received, The resource information acquisition means 17 which acquires the information on the quantity of an available resource in the actual condition when the application which received the connection request newly needs to be started, The stop application judging means 16 which judges the application which judges whether execution of the application which received the connection request from the information which the resource information acquisition means 17 acquired is possible, and should stop when impossible, An application stop instruction means 15 to perform stop instruction to the application 30 for [which the stop application judging means 16 determined] a stop.

[0015]the connection receiving means 11, an address, and an application -- also in the equipment which carries out the conventional system (drawing 12), the location management tool 13 and the application starting means 12 are realized.

[0016]Drawing 2 shows the operation flow of this equipment.

** A client program specifies URL 1, perform the connection request to the application 1, and the application controlling demon's 10 connection receiving means 11 receives this connection request.

** Identify whether the application state acquisition means 14 has the application 1 in the application under starting. If the application 1 is starting, operation of the application controlling demon's 10 starting management will be ended. While the application 1 is not starting, ** resource information acquisition means 17 acquires the quantity of an available resource now. The stop application judging means 16 judges whether execution of the application 1 is possible in the quantity of this resource. When not possible, ** stop application judging means 16 judges the application stopped based on the application log data managed by the application operation log management means 40.

[0017]As shown in drawing 3, log data, such as an application name, activity, and time, are managed by the application operation log management means 40, for example. The stop application judging means 16 judges application with the oldest end of transaction processing performed in the application under starting these days as stop application as a judgment algorithm, for example. In this case, the application 2 turns into application for a stop.

[0018]** The application stop instruction means 15 directs a stop to the application 2 used as

the candidate for a stop.

** an address and an application -- the location management tool 13, The table which described the correspondence relation of the place (location information) of an application name, an address, and program substance is managed, and the location information corresponding to application 1 / URL1 which received the connection request is searched from this table.

** the application starting means 12 -- an address and an application -- start the application 1 of the location position which the location management tool 13 searched.

[0019]In **, only in the quantity of the resource which can be used now, when execution of the application 1 is possible, processing of ** and ** is performed after **.

[0020]Thus, in this application controlling equipment, only when starting new application and a required resource is not securable, the application under starting is stopped and it does not stop other than it. Therefore, the probability which the application demanded by the client program is starting can become high, it can see synthetically, and reduction of the overhead at the time of starting can be aimed at.

[0021]As for the stop application judging means 16, it is also possible for the number of times from which processing was requested to judge stop target application based on the judgment algorithm which makes the fewest application applicable to a stop from a client program. In this case, the application 3 is elected as a candidate for a stop from the application log data of drawing 3.

[0022]In the application log data which the application operation log management means 40 manages, as shown in drawing 4, The stop application judging means 16 as a judgment algorithm which judges stop target application, including resource information required for operation of each application, In order to secure resource quantity required for the application which newly starts, the number of the stopping applications is able to select stop target application based on the algorithm which chooses the combination of the application used as the minimum. In this case, if it is necessary to secure the opening of 100 KB of resource in order to perform application 1, the application 4 will be chosen from drawing 4 as a candidate for a stop.

[0023]The number of the stopping applications can be lessened by using such a judgment algorithm. If it puts in another way, the application under starting can be kept [many] and the probability which the application demanded by the client program is starting can be raised.

[0024]Specifically, operation of the application controlling equipment explained by this embodiment is performed, when STB provided with broadcast reception or the function of an Internet connectivity receives the distribution service of contents from the server on the Internet based on the demand from a client.

[0025]The following procedures are needed when receiving the distribution service of contents.

(1) application (2) reception of a contents distribution service -- the check of a soft existence and a version -- if suitable receiving software does not exist, download.

(3) If the check receiving software of the state of receiving software has not started, hang starting.

(4) Other software will be suspended or uninstalled if the check resource of the remaining resource is insufficient.

(5) When contents distribution start STB performs processing of (3) and (4), perform the application controlling equipment of STB efficiently by the procedure which shows starting of receiving software required in order to receive distribution of contents by this embodiment.

[0026](A 2nd embodiment) A 2nd embodiment explains the application controlling equipment which performs download processing of application efficiently. This processing is equivalent to processing of the above in the case of receiving the distribution service of contents (2).

[0027]This equipment is provided with the following.

The connection receiving means 11 which receives the connection request to the application demanded by specifying an address from the client program as shown in drawing 5.

The application state acquisition means 14 which judges whether the demanded application is installed on the local disk 46.

The application starting means 12 which starts the demanded application.

the address and application which search the download place of application from the address which managed correspondence with the address of application, and application location information, and received the connection request -- with the location management tool 13. the case where the application by which the connection request was carried out is not installed on the local disk 46 -- an address and an application -- downloading agency information from the location management tool 13, [acquire and] Application download and an accumulation management means 45 to download the application to need to a local disk, The resource information acquisition means 17 which judges whether the disk space for application accumulation is insufficient when downloading application, Stop / deletion application judging means 161 which specifies the application deleted from the local disk 46 (uninstallation) when it runs short, and the application stop and deleting means 45 which delete the specified deletion target application from a local disk.

[0028]Drawing 6 shows the operation flow of this equipment.

** A client program specifies URL1, perform the connection request to the application 1, and the application controlling demon's 10 connection receiving means 11 receives this connection request.

** the application in which the application state acquisition means 14 manages accumulation of

the application to the local disk 46 -- acquire the information on whether the application 1 is installed on the local disk 46 from the download accumulation management means 45. the case where the application 1 is not installed -- ** resource information acquisition means 17 -- an application -- the empty disk storage capacity of the local disk 46 is acquired from the download accumulation management means 45. Stop / deletion application judging means 161 judges whether installation of the application 1 is possible with this empty disk storage capacity. When not possible, ** stop / deletion application judging means 161 judges the application deleted based on the application log data managed by the application operation log management means 40.

[0029]As shown in drawing 7, log data, such as an application name, activity, and time, are managed by the application operation log management means 40, for example. Stop / deletion application judging means 161 judges the longest application of stop time as deletion target application as a judgment algorithm, for example. In this case, the application 2 turns into application for deletion.

[0030]** An application stop and the deletion instruction means 151, an application -- pointing to deletion from the local disk 46 of the application 2 used as the candidate for deletion to the download accumulation management means 45 -- an application -- the download accumulation management means 45 deletes the application 2 from the local disk 46.

** an address and an application -- the location management tool 13 has managed the table which described the correspondence relation of the place (location information) of an application name, an address, and program substance, and the location information of the application 1 serves as a server on a network in this stage. an application -- the download accumulation management means 45 -- an address and an application -- the location information of the application 1 is acquired from the location management tool 13, and the application 1 is installed from the application download site which ** location information shows.

** an address and an application -- the location management tool 13 rewrites the location information of the program of the application 1 at the place of the installed local disk 46.

** After that, start the application 1 by the procedure of a 1st embodiment.

[0031]In **, when the application 1 is installed on the local disk 46, it shifts to **. In **, when the empty disk storage capacity which can install the application 1 exists, it shifts to **.

[0032]Thus, the disk storage capacity for application accumulation can be saved by installing according to a demand, without installing all the applications that may receive a connection request beforehand.

[0033](A 3rd embodiment) By a 3rd embodiment, an application controlling server explains the application controlling system which operates application controlling equipment by remote control.

[0034]This system comprises the network terminal 50 which has application controlling equipment, and the application controlling server 60 which controls installation and starting of application in the network terminal 50 through a network, as shown in drawing 8.

[0035]The application controlling equipment of the network terminal 50 is provided with the following.

The application situation remote providing means 18 which provides the application controlling server 60 with the information about the installation situation, and starting and a stop state of application via a network besides the composition (drawing 5) of a 2nd embodiment.

the remote which receives an installation demand and activate request of application from the application controlling server 60, and performs download installation and starting of application according to a demand -- an application -- the management demand receiving means 19.

[0036]The application controlling server 60 is provided with the following.

The application situation remote acquisition means 61 which acquires the situation (an installation situation, a starting situation) of application from the application controlling equipment of the network terminal 50 via a network.

The remote application controlling request means 62 which performs installation or an activate request via a network when application is not installed or it is not started.

[0037]The application controlling server 60 of this system is controlled to, install receiving software required in order to receive a contents distribution service in the network terminal 50 for example, before a client advances a demand, or controls that starting.

[0038]Drawing 9 shows the operation flow of this system.

** The application situation remote acquisition means 61 of the application controlling server 60 acquires the installation situation, and starting and a stop state of application from the application situation remote providing means 18 of application controlling equipment via a network.

** The remote application controlling request means 62 of the application controlling server 60 requires installation or starting of the application 1 via a network, when the application 1 is not installed or it is not started.

** application controlling equipment -- a remote -- an application -- the management demand receiving means 19 receives the installation demand or activate request from the application controlling server 60. When the application 1 is installed by the installation procedure explained by a 2nd embodiment when an installation demand was received and an activate request is received, the application 1 is started with the activation procedure explained by a 1st embodiment.

** the case where the new application 1 is installed -- an address and an application -- the

location management tool 13 adds the entry of the application 1 to a management table.

** Since the application 1 is already installed or is started when there is a connection request from a client program to the application 1, the demand of a client can be accepted immediately.

[0039]Thus, when a client carries out [this system] a connection request, even if application is not installed or started a priori by the terminal, The server side can grasp the situation of a terminal, application can be set as a predetermined state, and connection from a client can be enabled.

[0040](A 4th embodiment) In the application controlling system of a 4th embodiment, when downloading the application eliminated for resource reservation again, it has prevented that double accounting is carried out.

[0041]If in the service charged at the time of download of application it deletes for resource reservation of the purchased application as a 2nd embodiment explained, when downloading the application again, it will be charged again. This system has prevented such double accounting.

[0042]As shown in drawing 10, in this system the application controlling equipment of the network terminal 50, It has the terminal certifying means 20 for specifying and proving the possession person in charge of the network terminal 50, The terminal authentication means 63 with which the application controlling server 60 uses the terminal certifying means 20 at the time of application download, and attests a download place terminal, It has the terminal and the application royalty management tool 64 which manages correspondence with the network terminal 50 and application which were attested.

[0043]In this system, when the network terminal 50 downloads application from the application controlling server 60, the terminal authentication means 63 of the application controlling server 60 attests a download place terminal using the terminal certifying means 20. The terminal and the application royalty management tool 64 of the application controlling server 60 manage the correspondence relation of the network terminal and application which were attested.

[0044]the connection request with after that and a client for the second time which once deletes in the network terminal 50 for resource reservation of the purchased application 1 -- the application 1 -- re--- it may download and install. At this time, the terminal authentication means 63 of the application controlling server 60 attests the network terminal 50 by the terminal certifying means 20 of the network terminal 50. And a terminal and the application royalty management tool 64 check that the attested network terminal 50 has purchased the application 1 in the past from management data, and omits the fee collection to this download.

[0045]thus -- this system -- a terminal -- application -- re--- even when downloading and installing, double accounting can be prevented to the application purchased once.

[0046](A 5th embodiment) In the application controlling system of a 5th embodiment, even

when the application deleted for resource reservation has an user datum, the user datum can be saved by an application controlling server.

[0047]As shown in drawing 11, in this system the application controlling equipment of the network terminal 50, An user datum is evacuated to the application controlling server 60 at the time of deletion of application, It has an user-datum evacuation / restoration means 21 to restore an user datum at the time of re-installation, and has the user-datum management tool 65 in which the application controlling server 60 manages the evacuated user datum.

[0048]The application deleted for resource reservation in this system, When it has user data, such as operation logs, taste information, work data, user-datum evacuation / restoration means 21 of the network terminal 50 sends the evacuation demand of an user datum to the user-datum management tool 65 of the application controlling server 60, and transmits an user datum to it.

[0049]The user-datum management tool 65 accumulates and manages an user datum which received in response to an evacuation demand of an user datum. When user-datum evacuation / restoration means 21 of the network terminal 50 installs application again, it sends a restoration demand of said user datum to the user-datum management tool 65 of the application controlling server 60. The user-datum management tool 65 transmits an user datum which has won popularity and managed [accumulate and] a restoration demand of an user datum to user-datum evacuation / restoration means 21.

[0050]Thus, in this system, even when deleting application for resource reservation, an user datum which accompanies application can be saved, without consuming a resource of a terminal.

[0051]Networked home and a home gateway not only with STB but a scarce resource, a video telephone terminal, a game machine, etc. can be provided with application controlling equipment of this invention.

[Translation done.]

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- 3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]The block diagram showing the composition of the application controlling equipment in a 1st embodiment,

[Drawing 2]The flow chart showing operation of the application controlling equipment in a 1st embodiment,

[Drawing 3]The example of the application log data in a 1st embodiment,

[Drawing 4]Other examples of the application log data in a 1st embodiment,

[Drawing 5]The block diagram showing the composition of the application controlling equipment in a 2nd embodiment,

[Drawing 6]The flow chart showing operation of the application controlling equipment in a 2nd embodiment,

[Drawing 7]The example of the application log data in a 2nd embodiment,

[Drawing 8]The block diagram showing the composition of the application controlling system in a 3rd embodiment,

[Drawing 9]The flow chart showing operation of the application controlling system in a 3rd embodiment,

[Drawing 10]The block diagram showing the composition of the application controlling system in a 4th embodiment,

[Drawing 11]The block diagram showing the composition of the application controlling system in a 5th embodiment,

[Drawing 12]It is a figure showing the resource reduction methods in the conventional resided-permanently type daemon program.

[Explanations of letters or numerals]

10 Application controlling demon

11 Connection receiving means

12 Application starting means
13 an address and an application -- a location management tool
14 Application state acquisition means
15 Application stop instruction means
16 Stop application judging means
17 Resource information acquisition means
18 Application situation remote providing means
19 a remote -- an application -- a management demand receiving means
20 Terminal certifying means
21 User-datum evacuation / restoration means
30 Application
31 Log registration means of operation
40 Application operation log management means
45 an application -- a download accumulation management means
46 Local disk
50 Network terminal
60 Application controlling server
61 Application situation remote acquisition means
62 Remote application controlling request means
63 Terminal authentication means
64 Terminal application royalty management tool
65 User-datum management tool
161 Stop / deletion application judging means
151 An application stop and a deletion instruction means

[Translation done.]

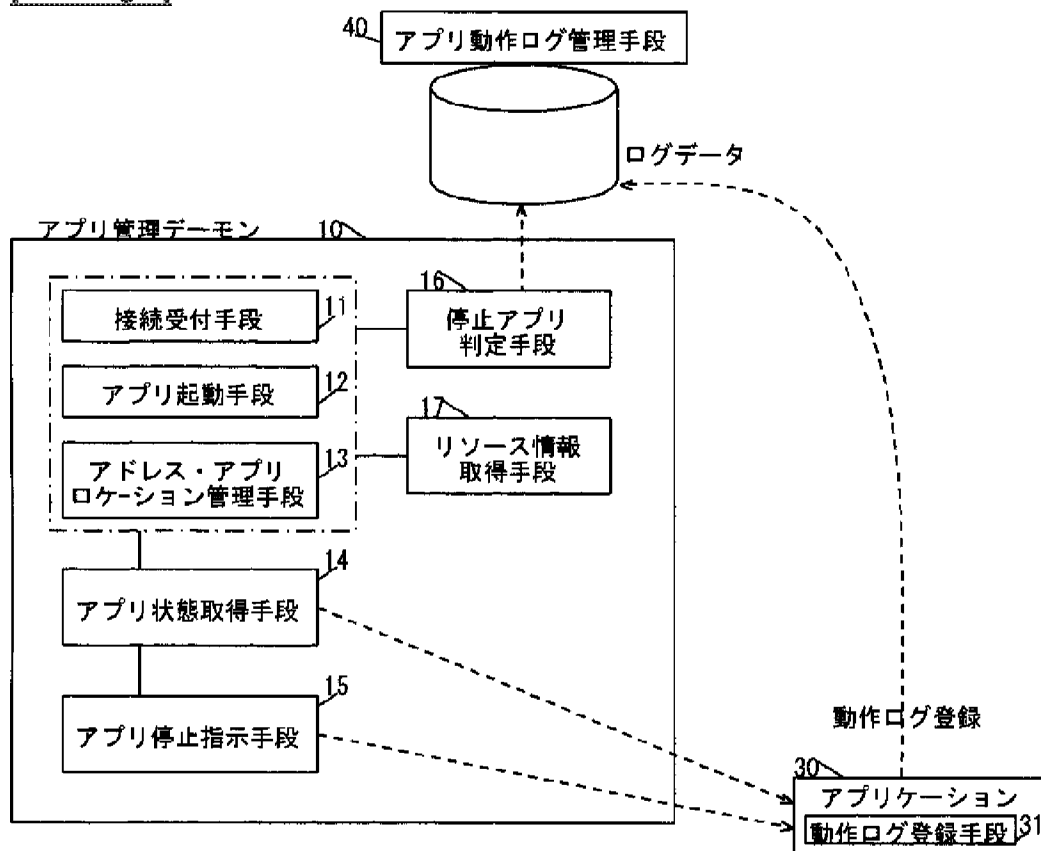
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DRAWINGS

[Drawing 1]



[Drawing 3]

アプリケーションログデータ例

アプリ名	動作内容	時刻
アプリ1	インストール	10:00
アプリ2	インストール	10:30
アプリ3	インストール	10:30
アプリ1	起動	10:35
アプリ2	起動	10:40
アプリ2	起動	10:40
~~~~~略~~~~~		
アプリ1	停止	12:30
アプリ2	トランザクション開始	14:39
アプリ2	トランザクション完了	14:40
アプリ2	トランザクション開始	15:39
アプリ2	トランザクション完了	16:40
アプリ3	トランザクション開始	16:59
アプリ3	トランザクション完了	16:00

[Drawing 4]

アプリの動作に必要なリソース情報

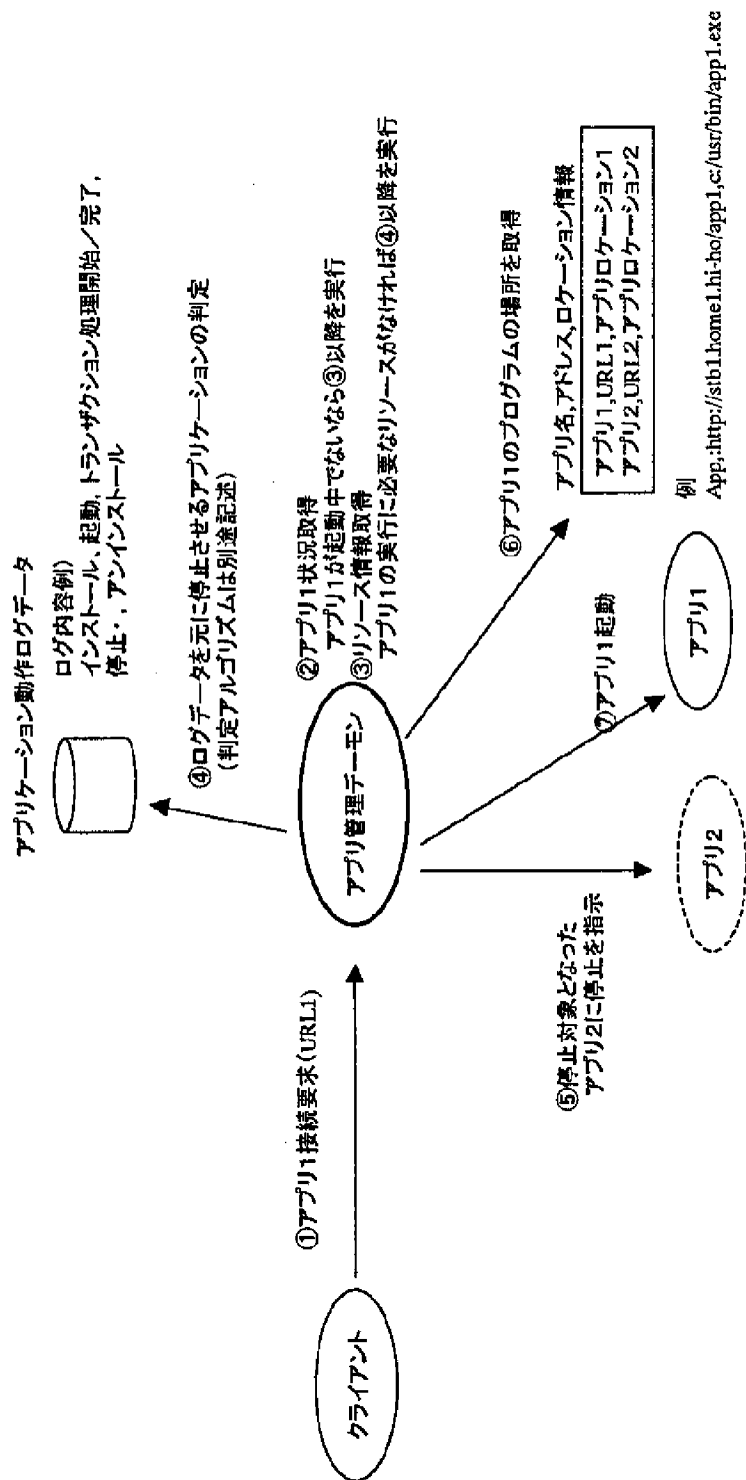
アプリ1	100KB
アプリ2	30KB
アプリ3	70KB
アプリ4	110KB

[Drawing 7]

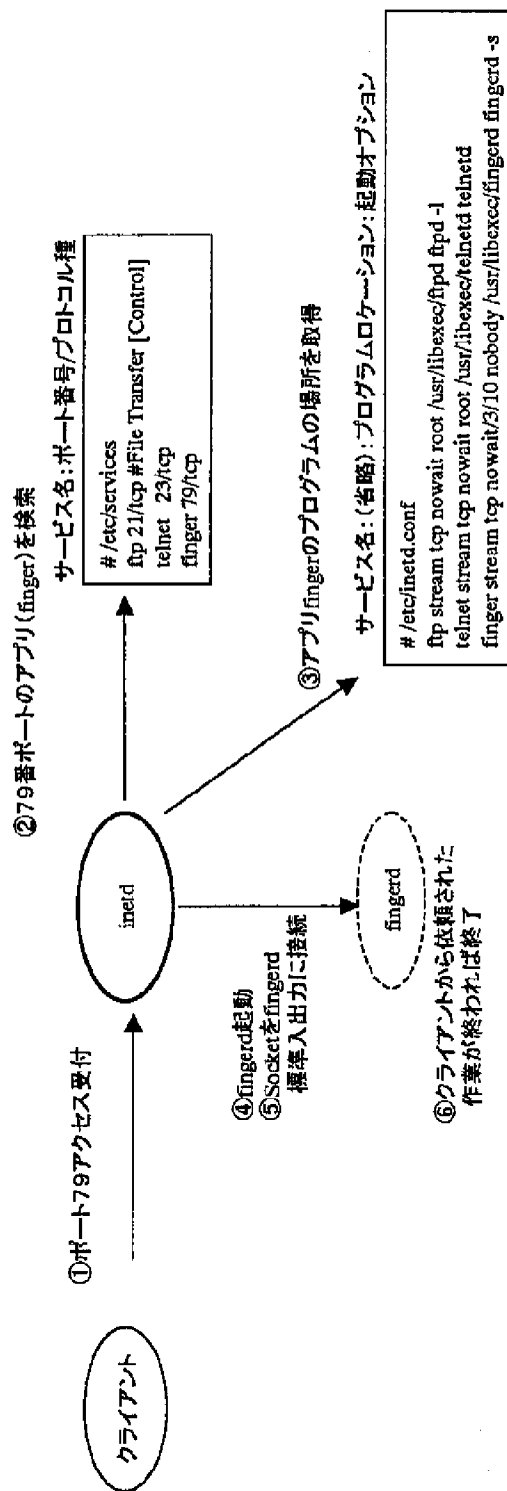
アプリケーションログデータ例

アプリ名	動作内容	時刻
アプリ1	インストール	10:00
アプリ2	インストール	10:30
アプリ3	インストール	10:30
アプリ1	起動	10:35
アプリ2	起動	10:40
アプリ2	起動	10:40
~~~~~略~~~~~		
アプリ1	停止	12:30
アプリ1	削除(アンインストール)	12:30
アプリ2	停止	14:39
アプリ3	停止	16:59

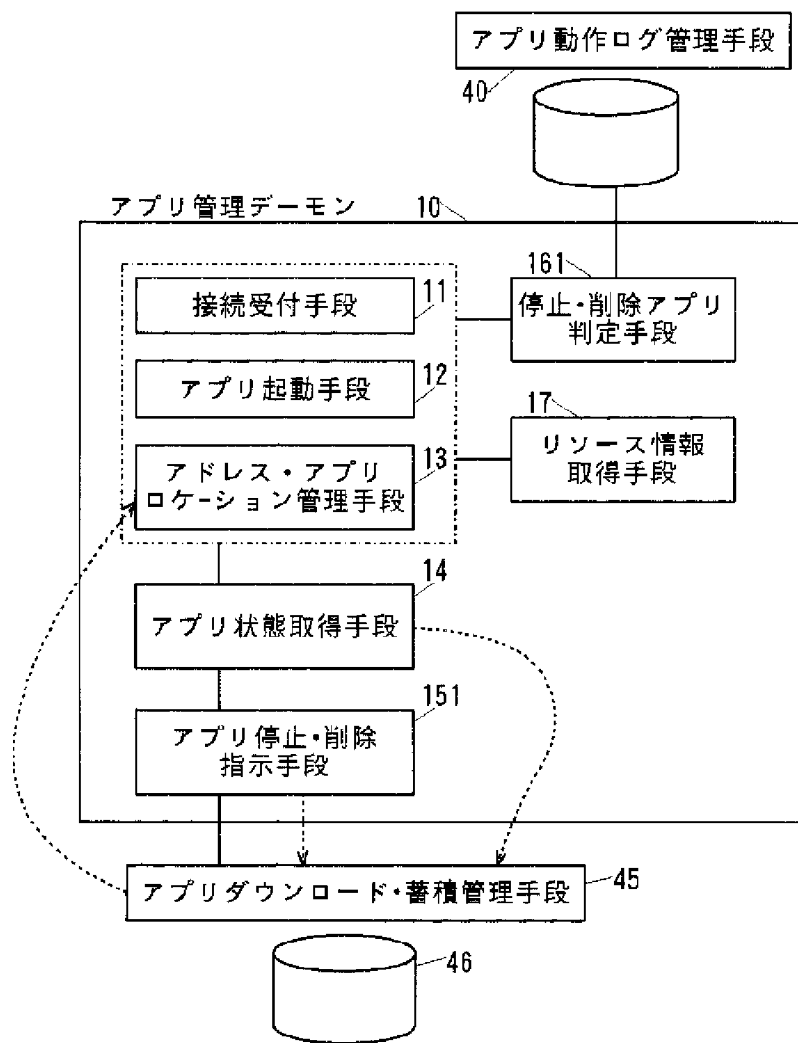
[Drawing 2]



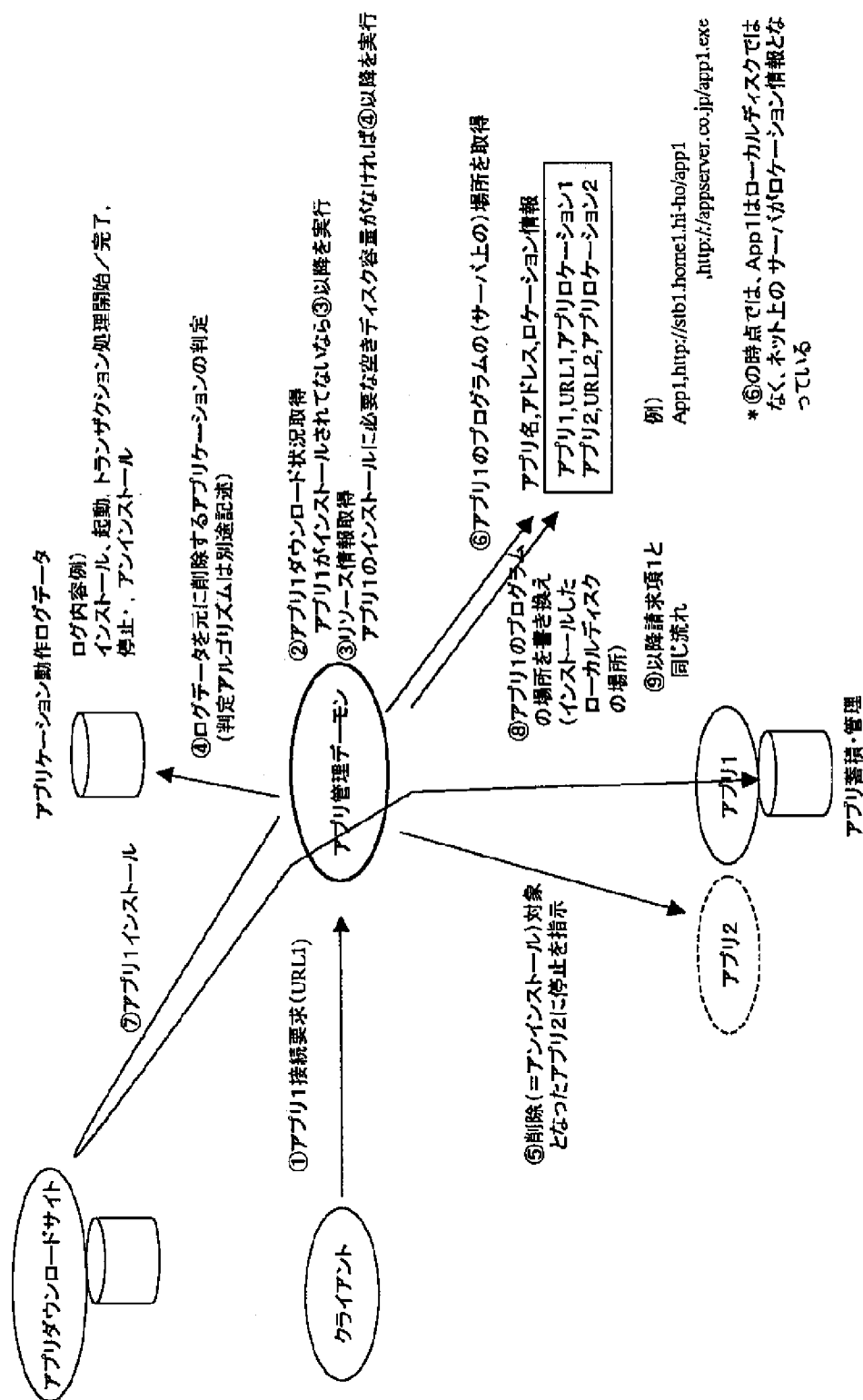
[Drawing 12]



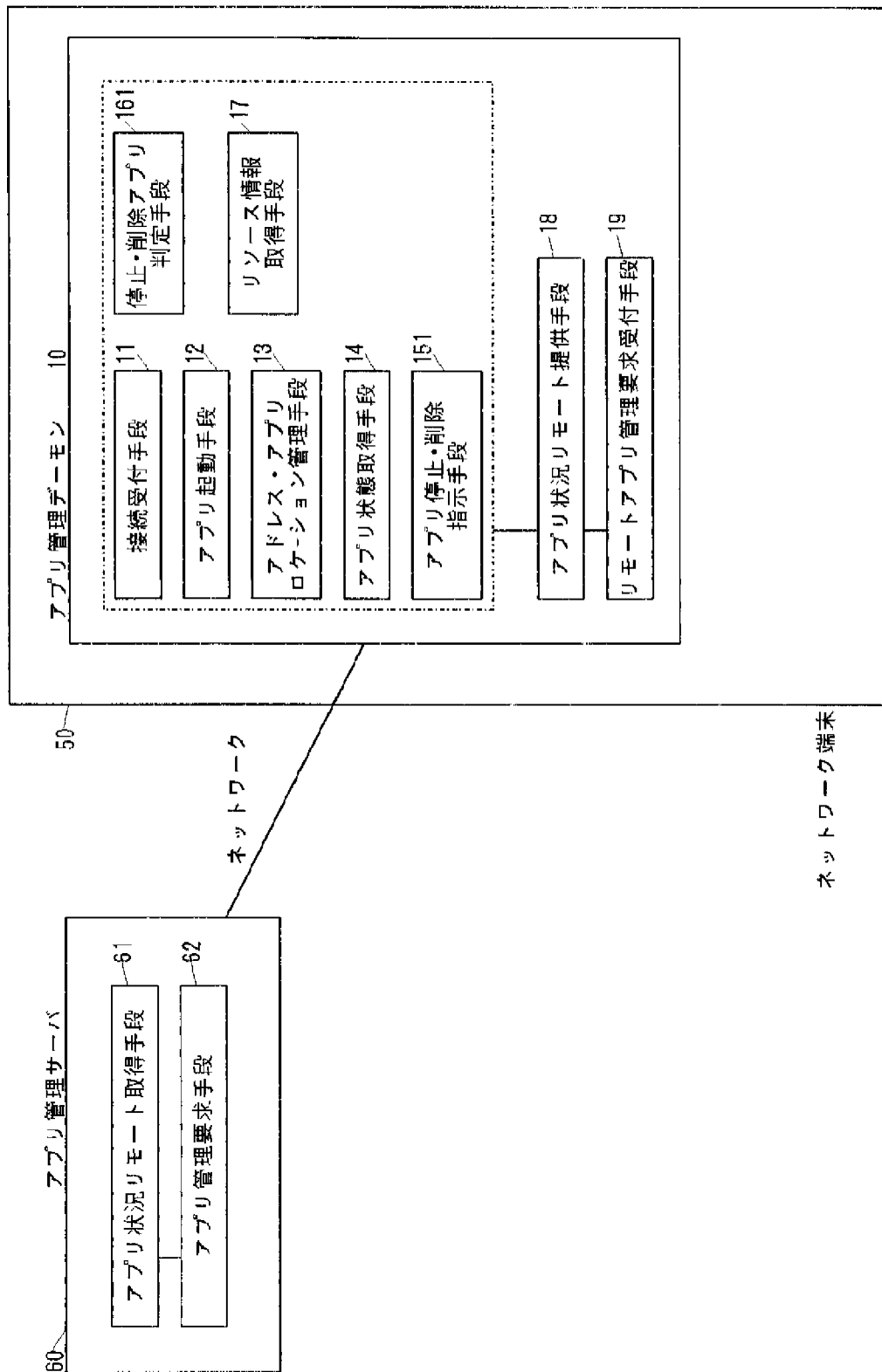
[Drawing 5]



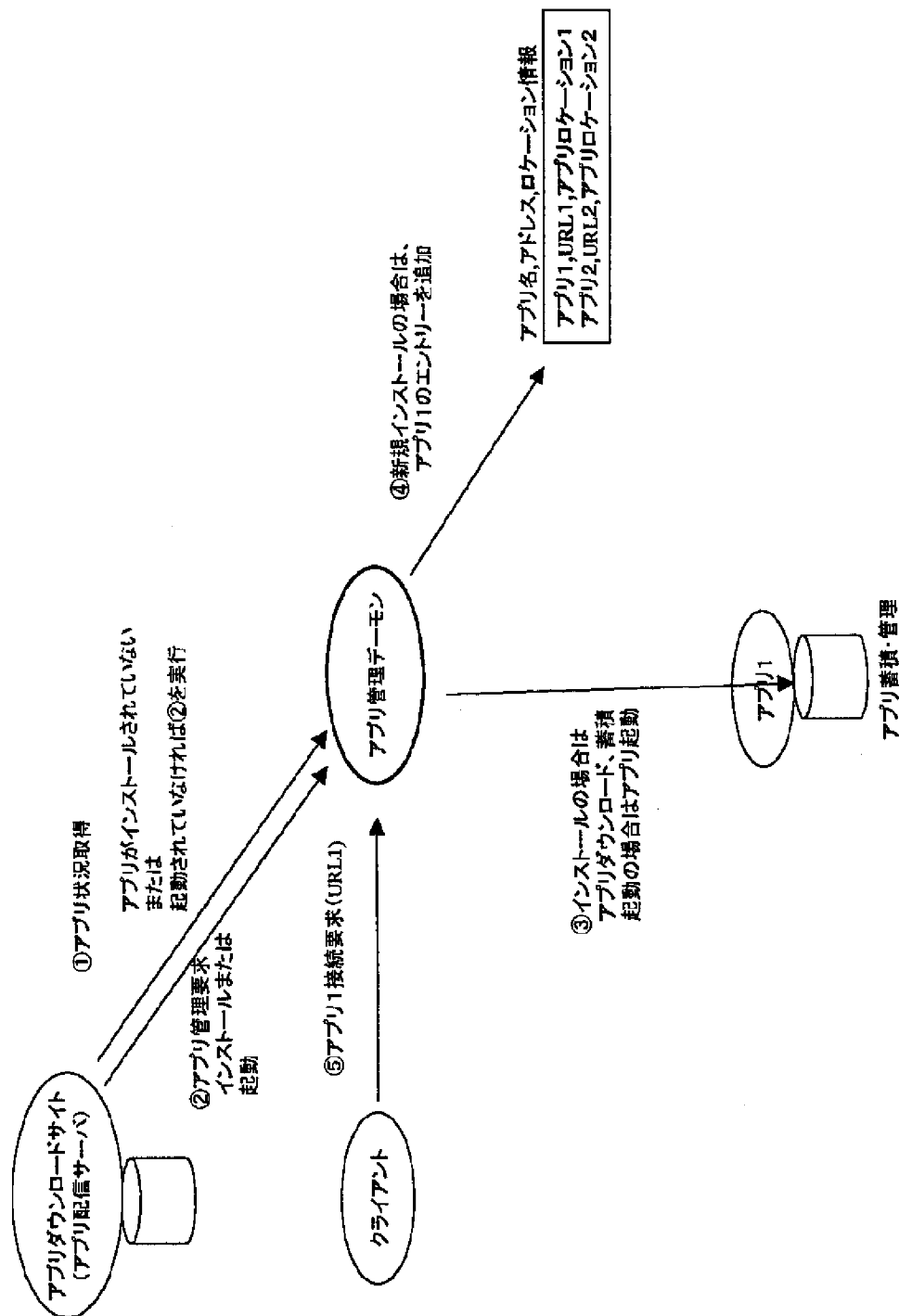
[Drawing 6]



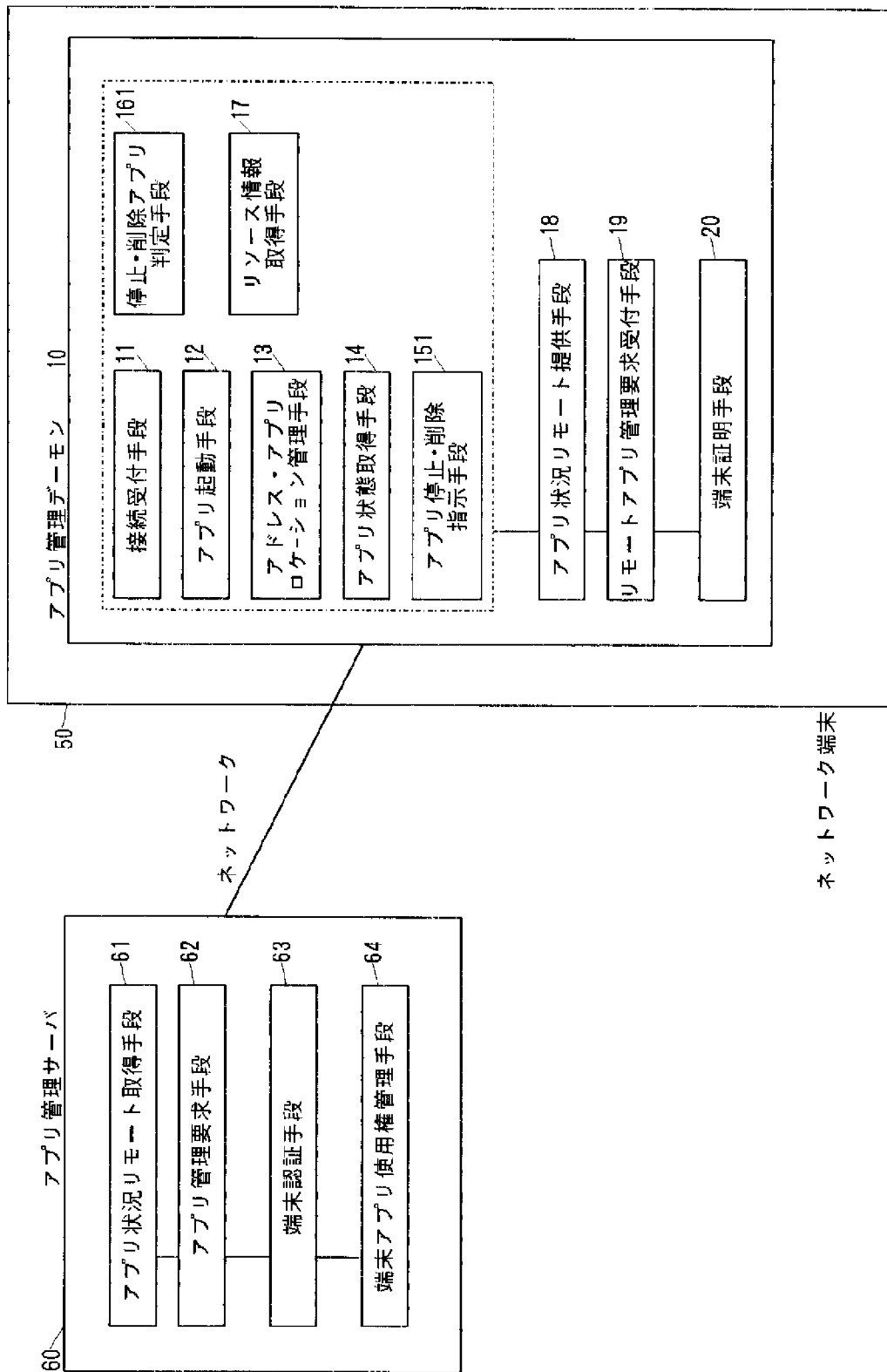
[Drawing 8]



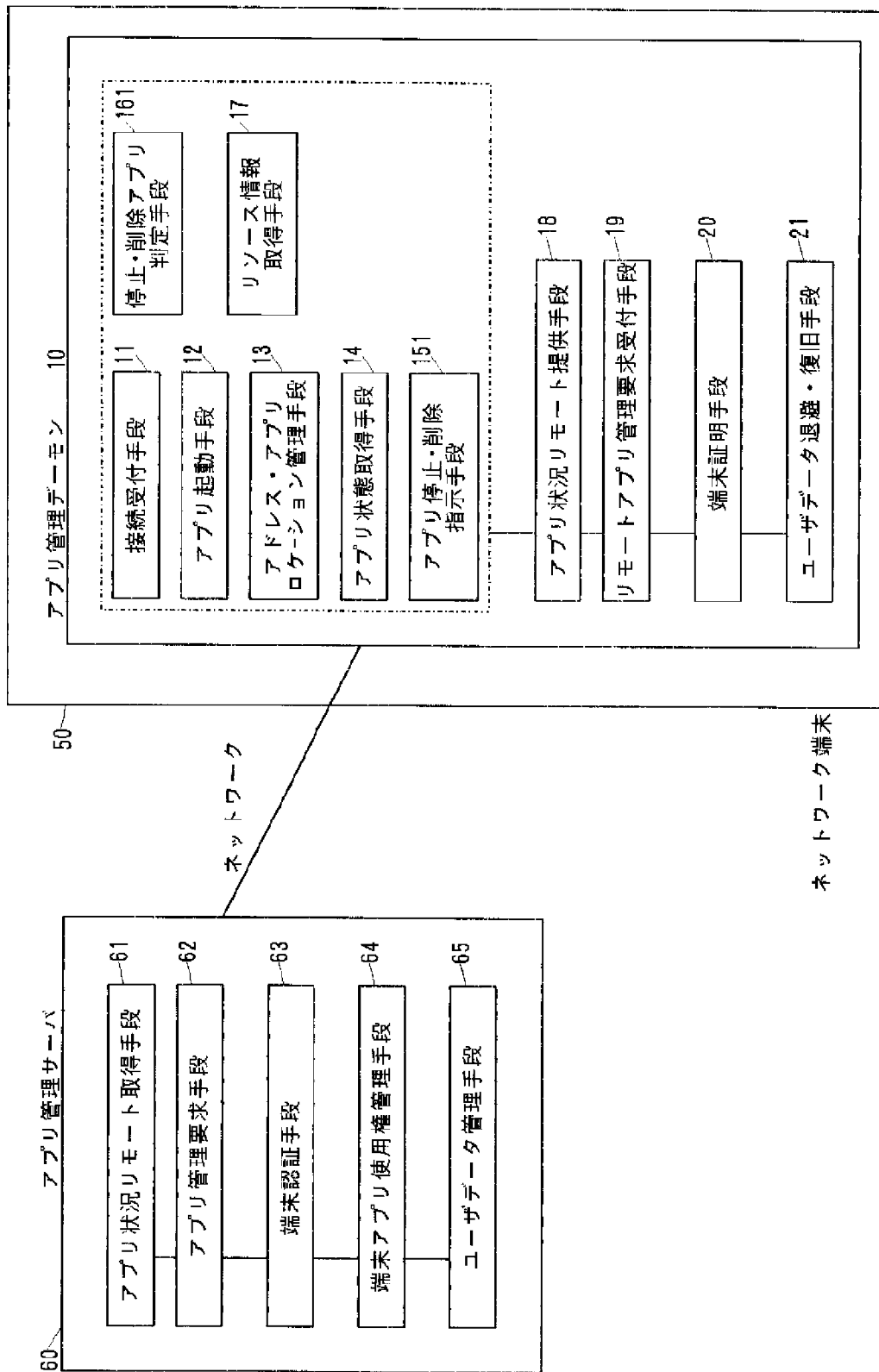
[Drawing 9]



[Drawing 10]



[Drawing 11]



[Translation done.]